APPLICATION FOR A
CAPITAL OUTLAY GRANT

FOR THE

URBAN WATER CONSERVATION PROGRAM

FOR

GOLDEN HILLS COMMUNITY SERVICES DISTRICT
P.O Box 637
Tehachapi, CA 93581

SUBMITTED TO THE:

DEPARTMENT OF WATER RESOURCES

UNDER THE

SAFE DRINKING WATER, CLEAN WATER, WATERSHED PROTECTION AND FLOOD PROTECTION ACT (PROPOSITION 13)

February 28, 2002

Prepared By:

286 W. Cromwell Avenue
Fresno, California 93711-6162
(559) 449-2700
FAX (559) 449-2715

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PART ONE

A. Project Information Form

1. Applying for (select one):
   - ☒ (a) Prop 13 Urban Water Conservation Capital Outlay Grant
   - ☐ (b) Prop 13 Agricultural Water Conservation Capital Outlay Feasibility Study Grant
   - ☐ (c) DWR Water Use Efficiency Project
2. Principal applicant (Organization or affiliation): Golden Hills Community Services District
3. Project Title: Water System Leak Detection & Rehabilitation
4. Person authorized to sign and submit
   - Name, title: Bill Fisher, General Manager
   - Mailing address: PO Box 637
Tehachapi, CA 93581
   - Telephone: (661) 822-3064
   - Fax: (661) 822-8284
   - E-mail: goldenhillscsd@mindspring.com
5. Contact person (if different):
   - Name, title: Dale Melville, District Engineer
   - Mailing address: 286 W. Cromwell Ave
Fresno, CA 93711-6162
   - Telephone: (559) 449-2700
   - Fax: (559) 449-2715
   - E-mail: dmelville@ppeng.com
6. Funds requested (dollar amount): $279,261
7. Applicant funds pledged (dollar amount): $0 (see Section D-2)
8. Total project costs (dollar amount): $279,261
9. Estimated total quantifiable project benefits (dollar amount): $592,863

Percentage of benefit to be accrued by applicant: 100%

Percentage of benefit to be accrued by CALFED or others: 0%

10. Estimated annual amount of water to be saved (acre-feet): 77

Estimated total amount of water to be saved (acre-feet): 3850

Over 50 years

Estimated benefits to be realized in terms of water quality, instream flow, other:

11. Duration of project (month/year to month/year): 10/02 to 06/03

12. State Assembly District where the project is to be conducted: 34

13. State Senate District where the project is to be conducted: 17

14. Congressional district(s) where the project is to be conducted: 21

15. County where the project is to be conducted: Kern

16. Date most recent Urban Water Management Plan submitted to the Department of Water Resources: Not applicable

17. Type of applicant (select one):
Prop 13 Urban Grants and Prop 13 Agricultural Feasibility Study Grants:

- ☐ (a) city
- ☐ (b) county
- ☐ (c) city and county
- ☐ (d) joint power authority
- ☒ (e) other political subdivision of the State, including public water district
- ☐ (f) incorporated mutual water company

DWR WUE Projects: the above Entities (a) through (f) or:

- ☐ (g) investor-owned utility
- ☐ (h) non-profit organization
- ☐ (i) tribe
- ☐ (j) university
- ☐ (k) state agency
- ☐ (l) federal agency

18. Project focus:

☐ (a) agricultural
☒ (b) urban

19. Project type (select one):
Prop 13 Urban Grant or Prop 13 Agricultural Feasibility Study Grant Capital outlay project related to:

☐ (a) implementation of Urban Best Management Practices
☐ (b) implementation of Agricultural Efficient Water Management Practices
☐ (c) implementation of Quantifiable Objectives (include QO number(s))

☒ (d) other (specify)
Water audit and system repairs

DWR WUE Project related to:

☐ (e) implementation of Urban Best Management Practices
☐ (f) implementation of Agricultural Efficient Water Management Practices
☐ (g) implementation of Quantifiable Objectives (include QO number(s))
☐ (h) innovative projects (initial investigation of new technologies, methodologies, approaches, or institutional frameworks)
☐ (i) research or pilot projects
☐ (j) education or public information programs
☐ (k) other (specify)

20. Do the actions in this proposal involve physical changes in land use, or potential future changes in land use?

☐ (a) yes

☒ (b) no

If yes, the applicant must complete the CALFED PSP Land Use Checklist found at http://calfed.water.ca.gov/environmental_docs.html and submit it with the proposal.

B. Signature Page

PART TWO

Project Summary

The proposed project has been developed to identify the locations of water losses within the Golden Hills Community Services District (GHCSD) distribution system and to repair and/or replace portions of the water system to reduce or eliminate water system losses. The construction project would involve installation of new flow meters, construction of new water mains and repair to existing water mains to eliminate the sources of leaks in the water distribution system. The GHCSD's primary function is to provide water services to residential, commercial, and industrial entities within its boundaries. GHCSD also provides stormwater drainage and limited road maintenance within its boundaries.

GHCSD anticipates reducing its unaccounted for water by 67% as a result of this project; this would return unaccounted water down to levels more representative of the past (1990's). This would reduce current losses from 9% to just below 3%, saving an estimated 77 af/y. This represents a savings of over 25 million gallons of water per year, which translates to a 6.0 percentage of savings on groundwater extractions from an adjudicated groundwater basin and associated pumping costs.

A. Relevance and Importance

1. Nature, scope, and objectives

The purpose of the project is to determine the sources and locations of unaccounted for water in the GHCSD distribution system and repair and/or replace leaking pipelines.

The ultimate goal of this process is to minimize unaccounted for water in the GHCSD distribution system by identifying the locations of leaking water mains and to repair or replace the reaches of pipe contributing to the water losses. In the process of minimizing water leaks, other goals will also be achieved by this project, including metering of deliveries into each of the seven (7) pressure zones. Additionally, GHCSD intends to pledge approximately $20,000 of their own funds for improved customer water meter reading (via data-loggers) and new accounting software to more efficiently monitor unaccounted water within the distribution system (refer to Attachment A).

Reduction of water losses will result in a reduction in pumping. The current energy crisis in the state of California demands that everyone minimize energy consumption. GHCSD records indicate that 9% of the District's pumped water is unaccounted for; therefore, there is a significant opportunity to reduce the District's energy consumption for pumping by nearly that amount. Additionally, the GHCSD is located within an adjudicated groundwater basin (Amendment to Judgment, Superior Court of the State of California for the County of Kern, November 20, 1973); any water pumped by the GHCSD is limited by pumping rights (allocated, purchased, or leased) and/or by

imported State Water Project (SWP) surface water deliveries. Since GHCSD's groundwater supply originates both from pumping rights and recharge of imported SWP water, decreasing groundwater pumping has a direct impact (1 for 1) to decrease GHCSD's requirements for imported SWP water.

GHCSD wants to mitigate the water losses within their system and by incorporating the tasks listed below; completion of these tasks would allow GHCSD to be able to improve their accountability for water usage within their system.

- Retain a qualified service to conduct a leak detection investigation and prepare a report
- Review report and prioritize leaks
- Use local contractor(s) and/or GHCSD staff to repair leaks and purchase and install additional flow meters and valves to monitor unaccounted water within the distribution system

Additionally, at the expense of GHCSD (refer to Attachment A, although not funded by this Proposition 13 Capital Outlay Grant), the District intends to:

- Install new water accounting software and purchase handheld data collection units
- Develop a new meter reading plan
- Calibrate existing wellhead flow meters
- Evaluate remote monitoring software

2. Need for the project

Effective and efficient distribution of water is a key part of the District's water management and operations. All water services within the GHCSD are metered. The District also has a resolution that gives them the authority to enforce water regulations during water hardship conditions. This resolution has a two-scale alert system and within each alert exists four (4) levels of violations. Punishment begins with a written notification and ends with a surcharge and/or shutting off of the customer's water service.

In 2001, the GHCSD pumped over 421 million gallons (1294 acre-feet) of water; 110 acre-feet (9%) of the water was unaccounted for. Refer to Table 7 for a summary of pumping, water use and unaccounted for water each year since 1998.

The GHCSD extracts its domestic water supply from 13 active wells located within the GHCSD. GHCSD management and their Strategic Planning Committee has projected (at a conservative 1.4% annual growth rate) a need for an additional average water supply of 400 af/yr and pumping capacity of 800 gpm within the next 20 years. Currently, GHCSD is fully utilizing the groundwater supplies within its boundaries to near the safe yield of its sub-basin. To meet existing and current needs, GHCSD has acquired and leased additional groundwater pumping rights and since 1987 has purchased surface water (State Water Project water via the Kern County Water Agency

and Tehachapi-Cummings County Water District) to supplement local adjudicated groundwater supplies.

Ongoing water management operations by the District has observed an increased level of unaccounted for water during the last two years as shown in Table 9 (8-9% versus 3-5% prior to that time). The District operates a SCADA system that monitors real-time data for their well and storage operations, which provides them excellent operations data on the production side. GHCSD efforts to date and experience with the aging (mostly about 40 years) distribution system, indicate that leaks are the most probable cause for the unaccounted water.

Possible explanations for unaccounted for water includes leaking water mains, water theft, and/or inaccurate meters. Water theft and inaccurate meters are both possible contributors to the problem, but are not expected to account for the magnitude of water lost from the system. The District's flow meters at each well were recently calibrated (1997) and pump tests conducted by Southern California Edison (2001) indicate that meters are functioning properly. This leaves water system leaks as the most likely and substantial source of unaccounted for water. Approximately 90% of the GHCSD water distribution system facilities were constructed in the 1960's. This existing infrastructure has aged to a point where the unaccounted for water is highly suspect to be related to water leaks from the effects of wear, abrasion, and corrosion of water mains.

Water management is a critical issue throughout California, and especially in areas where the groundwater rights have been adjudicated and expensive SWP surface water is imported to meet local demand. For the GHCSD, which depends entirely upon groundwater (from pumping rights or recharged SWP surface water) to meet its water needs, the ability to protect the quantity and quality of its groundwater supply is critical to its customers.

B. Technical/Scientific Merit, Feasibility, Monitoring & Assessment

1. Methods, procedures, and facilities

The District is located in an area with highly pervious soils, where leaking water often migrates deeper into the ground rather than showing signs at the surface. In the last three years, as documented in Table 9, the District has lost on average approximately 9% of its pumped water from the distribution system; the rate of loss has increased in each of the last 3 years from 46 af/y to 110 af/y in 2001. Beginning in the year 2000, unaccounted for losses doubled from historical levels; this trend continued in 2001. There are no visible indicators of potential leak locations.

We have consulted with American Leak Detection Company to review procedures and cost estimates for locating water system leaks. Initially the system will be surveyed for sonic indications of leaks with a survey tool, and segments with indications of leaks are identified for return to correlate the leak detection. The leak survey begins at one end of the system, or portion of system, and proceeds section by section until completed. Sensors are placed at intervals determined in part by the pipe size, material, ambient noise level, pressure, and availability of access. Generally, the setup length desired on a water distribution system is one city block.

Their leak detection service is performed using two primary pieces of equipment. First, the leak survey, which is performed to identify segments of pipeline with a leak is carried out by the use of a highly sensitive sonic meter for determining leak sound levels on hydrants, and valves and with attachments may be used as a ground microphone for confirmation of pinpointed leaks.

Pinpointing of leaks is performed with either a proprietary ground vibration sensor, or with a Correlator. The Correlator is a device that includes two very sensitive preamplifier microphone / radio transmitters and a central microprocessor to correlate the location of the leak detection received. It is effective on all kinds of pipe, including non-metallic and large diameter.

Other types of equipment available for use to assist the survey process include electronic line location tools, pin and box locators, and a proprietary filtered ground microphone.

The results of the leak detection survey include a precise computerized pictorial record of each located leak, which includes dimensions from known system points and geographic locations. Records of all setups, measurements and leak locations are kept in a Correlation Survey Log that is provided as a part of their service. Also included will be notes from their daily survey activities and a Leak Summary itemizing all leaks located during their survey.

2. Task list and schedule

The work plan for the proposed Urban Water Conservation Program details the scope of work needed to identify water leak locations and provide construction documents and supervision.

The objectives of this project are to investigate the condition of the water distribution system, identify leaking or failing water mains, evaluate construction alternatives, and implement the most cost-effective alternatives; these objectives will be accomplished through the following tasks:

Task 1. Compile existing information. Acquire and utilize as-built drawings, record maps, low-pressure complaints, and pipeline repair records from District records

Task 2. Classify all pipelines by age and pipe material to prioritize the leak detection investigation

Task 3. Perform leak detection survey

Task 4. Evaluate alternatives for repair of all water mains identified in leak detection survey

Task 5. Prepare quantity take-off and estimate of probable construction costs based on conceptual design plans

Task 6. Determine which permits, CEQA documents, and approvals are needed for the project and the requirements/conditions needed to secure such authorizations

Task 7. Prepare plans and specifications

Task 8. Advertise for construction bids

Task 9. Award construction contract

Task 10. Perform water system repairs

Task 11. Quarterly progress reports

Task 12. Final report

In the unlikely event that in the leak detection survey determines that the water system losses are not due to leaking water mains or components and it is determined that the project would not be feasible, the District may opt to cease work on the study. Cessation in work would require consultation and approval with DWR and the District

Board of Directors. Work on the project would stop and unused grant funds would then be available by DWR to fund other eligible projects.

An estimate of costs, by task, is provided as Table 1 and project timetable as Table 2.

The work plan tasks are provided with additional detail below:

Task 1. Compile existing information. Acquire and utilize as-built drawings, record maps, low-pressure complaints, and pipeline repair records from District records.

Existing as-built drawings and pipeline repair records will be gathered and reviewed by the project team. Year of installation, size of pipe, type of pipeline material and repair type and locations will be gathered for input into the District's CAD drawing of the water distribution network. A layout of the District's existing water mains is included in the Appendix.

Task 2. Classify all pipelines by age and pipe material to prioritize the leak detection investigation.

The data gathered in Task 1 will be input into the District's CAD drawing. With this model, we can then summarize and prioritize the water system pipelines for likelihood of leaks. The oldest pipelines comprised of materials other than PVC would be the first priority for investigation for leaks. Pipeline sections requiring frequent repairs would indicate an increased potential for water losses. Areas of low water pressure may also indicate water losses. The network analysis model of the water system would be updated and reviewed with respect to actual water system deliveries and pressures. The number and size of water services will be verified. The location of existing valves will also be verified with respect to adequacy for isolation of pipeline segments during the investigation and during rehabilitation or replacement activities.

Task 3. Perform leak detection survey.

The American Leak Detection Company, headquartered in Palm Springs, California, will perform the leak detection investigation. Through the use nondestructive methods such as electronic ground contact microphones and sound acoustical time delay equipment (Correlator), they will survey the District water system for leaks.

Upon completion of the investigation, American Leak Detection Company will provide a report containing a summary of the lines surveyed, the condition of the pipelines, areas of concern, and recommendations for repair of the leaking pipelines. Locations where leaks are detected will be marked in the field so that they can be surveyed for preparation of

construction plans. An estimate of the quantity of water losses that may be saved would be prepared for the various segments of the water system.

Task 4. Evaluate alternatives for repair of all water mains identified in leak detection survey.

The results of the leak detection survey will be evaluated to verify the locations of water leaks in the GHCSD distribution system. The results of the leak detection investigation will include a summary of the condition of the pipelines and particular areas of concern.

Depending on the material type and age of the pipelines needing repair, various construction alternates will be evaluated for cost effectiveness. These alternatives may include new pipelines (conventional), pipe bursting, slip-lining, and other new developments. The advantages and disadvantages of the various alternatives will be reviewed on a site-specific basis.

Task 5. Prepare quantity take-off and estimate of probable construction costs.

Construction costs would be estimated at 2002 prices using prevailing wage scales; estimated construction costs would be shown on a bid schedule. Critical order of work or health issues that may influence construction activities would be identified.

Items of work for construction would be broken down into mobilization, including insurance and bonds, water pipe replacement by size, trench resurfacing and removal and replacement of existing improvements.

Other costs would include design and engineering, administration, and legal.

Task 6. Permits and CEQA

The requirements needed for obtaining permits and approvals such as encroachment permits from the County of Kern, other utilities, and Caltrans would be determined. A Notice of Exemption is anticipated to be filed to comply with CEQA Sections 15301 and 15302 (repair and replacement of existing facilities).

Task 7. Prepare plans and specifications

Based upon the evaluation of pipe repair alternates plans and specifications will be prepared for construction of the pipeline leak repairs identified by the leak detection survey.

Task 8. Advertise for bids

Bids will be solicited by publishing a notice to contractors in a local newspaper. Contractors will be given thirty (30) days to acquire/review plans and specifications and submit their bid proposals.

Task 9. Award construction contract

All contractors, who submitted bids on time to the District, will be asked to attend a bid opening. The project will be awarded to a contractor with the lowest qualified bid.

Task 10. Water system repairs

Pipeline repairs will be fixed according to a prioritized schedule developed by the District. This process will ensure that the most immediate repairs are dealt with first. Provost and Pritchard Engineering Group, Inc., will perform the required construction observation services as needed by the District.

Task 11. Quarterly progress reports

The District will prepare quarterly reports discussing pipe repair progress. Each report will call out pipe type, diameter, length; type of repair performed; cost associated with the quarterly repairs; and repairs scheduled for the next quarter.

Task 12. Final report

A draft report will be prepared after all repairs are complete. This report will discuss repairs accomplished during construction, water savings results, if any, and other benefits to the community.

3. Monitoring and assessment

All wells in the GHCSD water distribution system are metered, with daily and monthly total flows logged for monitoring. All District customers are metered. Recent water meter readings show that significant amount of water is lost through their distribution system.

The GHSCD will continue to meter all well production and water deliveries to the majority of their customers. Upon completion of the water audit and water system repairs, the data logged from the meters will be evaluated on a monthly basis and summarized on a yearly basis to evaluate the effectiveness of the project. Recent months have shown an increase in the difference between water pumped and water used by metered consumers in excess of 35 million gallons per year. The evaluation of future metering data would utilize the recent past as a benchmark for performance.

The pumping costs sustained by the GHSCD will be compared to past data as a secondary check on the performance of the project. Pumping costs are expected to drop proportional to the water savings as a result of the project.

4. Preliminary plans and specifications and certification statement

Plans and specifications will be prepared for repairs and replacements identified via the water system audit. Plans and specifications will be prepared in accordance with the District's water improvement standards and in conformance with good engineering practices.

C. Qualifications of the Applicants and Cooperators

The experience and qualifications of the GHCSD engineering staff and cooperators are demonstrated in the resumes on the following pages. Provost & Pritchard Engineering Group, Inc. is the District Engineer for GHCSD and will provide project management and engineering services for the proposed project.

Provost & Pritchard Engineering Group, Inc., began establishing a tradition of engineering excellence in Central California in 1968. Today, the company offers more registered engineers and local staff than any other engineering office in the San Joaquin Valley. Accordingly, we have developed expertise in a diversity of technical services.

The following is a summary of the project team; complete resumes are provided in the Appendix.

Project Manager
Dale Melville, PE is a Principal Engineer with Provost and Pritchard Engineering Group, Inc., and has been the District Engineer for the Golden Hills Community Services District since 1979.

Project Engineer
Jim Patten, PE is an Associate Engineer with Provost & Pritchard Engineering Group, Inc., and for several years has provided technical support services to Golden Hills Community Services District operations.

Project Inspector
John Hernandez, RCI is a Construction Inspector with Provost & Pritchard Engineering Group, Inc., and has over 30 years of experience with construction projects and construction management; he has been involved with various construction projects for the Golden Hills Community Services District.

Leak Detection
American Leak Detection Company has been the recognized world leader in the detection of concealed leaks since 1974. They will provide leak detection services to determine the extent and locations of water main leaks to facilitate design pipeline repairs and replacements to eliminate water system leaks.

D. Benefits and Costs

1. Budget breakdown and justification

The benefits to be realized and information to be gained by the proposed leak detection survey and subsequent construction are many. First and foremost, the project has the potential to eliminate significant water losses from the GHCSD water distribution system. This in turn will help the District meet water management goals. Additional benefits include a decrease of the potential for water quality issues that may result from low pressure or intrusion to the water system through the leaking facilities.

As a result of reduced or eliminated water losses, energy use and pumping costs are greatly reduced. The current energy crisis in the state of California demands that everyone minimize energy consumption. GHCSD records indicate that 9% of the District's pumped water is unaccounted for; therefore there is an opportunity to reduce the District's energy consumption for pumping by nearly that amount. Water that would previously have been lost would now be available to expand economic development without additional water supply sources. The District would be able to reduce their reliance on imported SWP water to recharge the adjudicated groundwater basin. In addition, portions of the water system may benefit from more consistent and higher water system pressure.

2. Cost-sharing

The District is not directly providing cost sharing funds for this grant application; however, on Monday, February 25, 2002, the Board of Directors approved funding for a hand held data entry unit and a software upgrade of the District's billing system (at an estimated cost of $20,000) if their grant application is approved (refer to Attachment A).

3. Benefit summary and breakdown

The leak detection survey will result in recommendations regarding capital expenditures to the existing water distribution system based on specific examination of existing facilities. In addition to the many benefits, there is valuable information to be gained by the survey. As a result of the review and compilation of water system data, effective distribution system information will be available in CAD for the County, the State and the DWR. This information will be useful for evaluation by GHCSD and the state Department of Health Services for continued service to the existing and future customers of the District.

4. Assessment of costs and benefits

Listed below are the various cost and analysis assumption used to determine project capital cost, operations and maintenance, and benefit cost.

- The economic evaluation is based on a 50-yr analysis period
- No inflation or escalation of cost was used in this evaluation

- A 6% discount rate was used to reflect the time value of money
- Purchased water cost from TCCWD for 2001 is $360/ac-ft (refer to Attachment B in the Appendix)

Tables summarizing costs and benefits for this grant application are located in the Appendix of this grant application.

A breakdown of capital costs for this grant application is presented in Table 3. This table is divided into two (2) main categories: capital cost and manpower.

Tables 4 and 5 show the distribution of operations and maintenance costs and a total cost summary for the proposed project.

Costs for Table 6 were divided into operation and maintenance cost required for pump operation. Operation of one pump has negligible affect on administrative duties; therefore, no dollar amount was assigned to this category. The expected benefits from this project, including the discount rate are presented in Table 7.

Using the economic information from above, Table 8 shows the dollar value benefit of the proposed project. The B/C ratio is 1.78.

E. Outreach, Community Involvement and Acceptance

The ultimate goal of this project is to minimize unaccounted for water in the GHCSD distribution system by identifying the locations of leaking water mains and to repair and/or replace the reaches of pipe contributing to the water losses.

In addition, groundwater pumping can be reduced because the District will not need to pump at a higher flow rate in order to supply enough water for customer demand and lost water. Lower pumping rates require less horsepower and energy to operate, thereby, reducing pumping cost and customer water bills. Furthermore, the District would be able to reduce their reliance on imported SWP water (equivalent to the amount of water conserved by this project) to recharge the adjudicated groundwater basin.

To improve involvement in the community, the District will advertise for a construction contract in both the local and regional newspapers. This will allow local contractor and construction workers the opportunity to get involved with a project that will benefit their community.

APPENDIX

Tables

Insert Table 1

Insert Table 2

Table 3 - Capital Costs

Task	Capital Cost Category	Cost	Contingency Costs		Subtotal
			Percent	Dollars	
a	Land Purchase/Easement	$ 0	15%	$ 0	$ 0
b	Planning/Designing/Engineering	36,925	15%	5,539	42,464
c	Materials/Installation	156,050	15%	23,408	179,458
d	Surveying	7,000	15%	1,050	8,050
e	Structures	0	15%	0	0
f	Equipment Purchases/Rentals	0	15%	0	0
g	Environmental Compliance	500	15%	75	575
h	Construction Administration/ Overhead	7,800	15%	1,170	8,970
I	Project Legal/ License Fees	1,560	15%	234	1,795
j	Leak Detection Services	33,000	15%	4,950	37,950
	Total				$ 279,261

Footnotes:
(1) Task h cost is 5% of Task c; Task I cost is 1% of Task c
(2) Refer to Table 1 for details for Task b, d, and j

Detailed estimate for Task c above (Materials/Installation)

Table 3a - Materials/Installation

Item	Description	Quantity	Unit	Unit Cost	Total
1	Replace 12-in conveyance line	1300	LF	$ 38.50	$ 50,050
2	Water meter at pressure relief	2	EA	5,000	10,000
3	Water meter at transfer valve	2	EA	5,000	10,000
4	Water meter at hydro tanks	4	EA	5,000	20,000
5	Potential water system repairs	1	LS	50,000	50,000
5	Valve vaults	2	EA	8,000	16,000
	Total				$ 156,050

Table 4 - Annual Operations and Maintenance Costs.

Cost of Water	$ 360	per AF
Avg Annual Water Purchased	0	AF
Cost of Pumping (5)	$ 94.00	per AF

Annual Administration	Annual Operations (1)	Annual Maintenance (2)	Annual Water Purchases (3)	Annual Water Extractions (4)	Annual Other	Total Annual O&M Costs	Total Discounted O&M Costs
$ 0	$ 1,000	$ 1,000	$ 0	$ 0	$ 0	$ 2,000	$ 31,400

Footnotes:
(1) Estimate for meter reading and inspections
(2) Meter calibration and maintenance
(3) Average annual recharge (AF) x water cost per AF x 100%.
(4) Cost of pumping per AF x 100% of average annual total recharge.
(5) Based on 2001 Southern California Pump Tests on District wells

Table 5 - Total Cost Summary.

Capital Costs	Discounted O&M Costs	Total Discounted Project Costs
$ 279,261	$ 31,400	$ 310,661

Table 6 - Avoided Costs of Future Supply Sources (Water Supply Benefits)

Future Supply Sources	Total Capital Costs ($)	Capital Recovery Factor	Annual Capital Costs ($)	Annual O&M Costs (1) ($)	Total Annual Costs ($)	Annual Supply - Avg (AF)	Annual Costs ($/AF)	Annual Displaced Supply - Avg (AF)	Annual Avoided Costs ($)
Excess Pumping	$0	0.0634	$0	$37,762	$37,762	77	$490	77	$37,762
Total									$37,762

Footnotes:

(1) Cost is comprised of the various categories listed below

Purchase Cost - $360/af x avg 77 af/y = $27,720/y

Energry Cost - $94/af x avg 77 af/y = $7,238/y

Operations Cost - $500/y; responding to leaks/ inspection of mains of concern

Chemical Costs - $1.30/gal x 234 gal/y = $304/y; assume 2 mg/l dose, $1.30/gal is chemical cost

Maintenance Costs - $2,000/y; repairing leaks (emergency repairs and scheduled repairs)

Administration Costs - $0/y

Table 7 - Total Water Supply Benefits

a	Annual Avoided Costs of Current Supply Sources	$	-
b	Annual Avoided Costs of Future Supply Sources	$	37,762
c	Annual Expected Water Sales Revenue	$	-
d	Total Annual Water Supply Benefits	$	37,762
e	Discounted Water Supply Benefits	$	592,863

Table 8 - Benefit/Cost Ratio

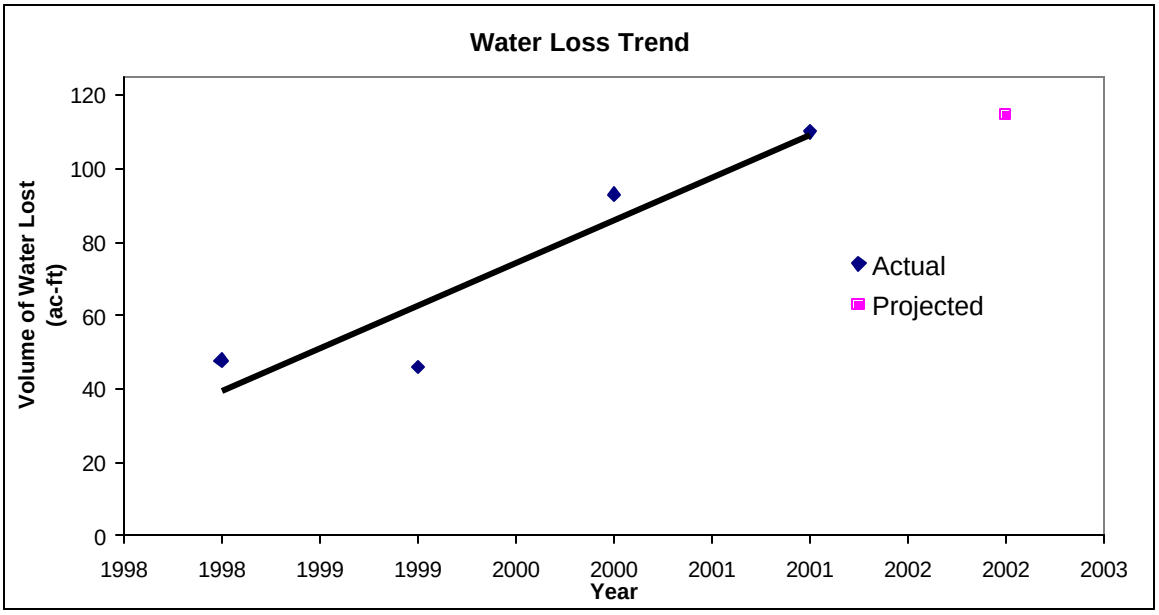
a	Total Discounted Water Supply Benefits	$	592,863
b	Total Discounted Project Costs	$	310,661
c	Benefit/ Cost Ratio	$	1.91

Table 9 - Water Accounting

Year [A]	Water Pumped (ac-ft)	Total Water Lost (ac-ft)	Total Water Lost (%)
1998	1013	48	5
1999	1116	46	4
2000	1160	93	8
2001	1294	110	9
Projected 2002	1312	115	9

Footnotes:

A - 2002 data was based on a trend established from information the District gathered between 1998 to 2001



Figures

Water Distribution System Map

USGS MAP

Attachments

Special meeting

Water Rate

Resolution

Resumes

Dale Melville, PE

Mr. Melville is the President and a principal engineer for the water resources division of Provost & Pritchard. With twenty-eight years of consulting engineering experience, he is involved with projects related to all aspects of water and wastewater. He is the manager and engineer for Dudley Ridge Water District and consulting or district engineer to several municipal and agricultural districts. Mr. Melville's experience includes site investigations, feasibility studies, management of projects related to design and construction of both municipal and agricultural water and wastewater conveyance and treatment systems, wastewater reclamation, agricultural irrigation and drainage systems, water transfers, and groundwater recharge/extraction facilities. He is a Board member for the Kern Water Bank Authority, the largest groundwater banking facility in the world.

Mr. Melville has established working relationships with numerous State and Federal government agencies in preparing applications and securing grant and loan funds for public works projects. For over twenty years he has served as District Engineer for Golden Hills Community Services District (CSD), a community with 3,000 water connections that includes numerous wells and storage tanks, groundwater recharge facilities, roads and drainage improvements, and is partially sewered to a wastewater treatment facility. He has also served for over twenty years as District Engineer for Boron CSD, community of approximately 2,000 with community water and wastewater sewer/treatment systems. Mr. Melville has also managed numerous water and wastewater feasibility, design, and construction projects for communities throughout the Central Valley.

EXPERIENCE

Richgrove Community Services District, Tulare County, CA - District Engineer and Project Manager for a water supply study to evaluate alternatives for the district to up-grade its groundwater supplies to meet primary and secondary drinking water standards. Three existing district wells are uniquely and separately impacted by high levels of DBCP, nitrate, hydrogen sulfide, and arsenic. Wellhead treatment and drilling a new well(s) are being investigated, along with an application for grants and low interest loans to this low income community.

Mariposa Public Utility District, Mariposa County, CA - Design Engineer for an innovative retrofit and upgrade of the water treatment plant serving this community; Project Manager for construction management services for a $10 million water supply project (7 cfs, 2000' lift pumping station with 2-1000 hp pumps, 8 mile 12” transmission main, 4.16 KV electrical substation, and 1.0 MG storage facility). Project Manager for design and construction of a $1 million water distribution system expansion and 1.0 MG storage project.

Armona Community Services District, Kings County, CA - Prepared an evaluation, recommendations, and secured a 50% Federal grant through EDA to upgrade and expand existing overloaded wastewater treatment and disposal

facilities; Project Manager for design and construction of $1.6 million in recommended improvements.

Golden Hills Community Services District, Kern County, CA - District Engineer since 1979. Project Manager for the planning, design and construction management of a 1.4 mgd surface water treatment facility; secured low interest funds through DWR - Safe Drinking Water Act to finance the project. Project Manager for a $0.7 million groundwater recharge and extraction project to provide domestic water to the community; secured funding through DWR - Proposition 82 for groundwater recharge project financing. As District Engineer, has provided input on numerous subjects, including water rate studies, wastewater treatment and reclamation facility operations, master planning a $20 million wastewater system, design and construction of numerous wells and wellhead treatment improvements, road reconstruction, drainage improvements, and rehabilitating 5 water storage tanks, and design and construction of a 1.0 MG welded steel storage tank.

City of Huron, Fresno County, CA - Assisted in securing Federal grant/loan funding, developed design concepts, provided quality control reviews during design and construction of new 1.0 mgd water treatment plant expansion, 12" water transmission main, and water storage and booster pumping facilities.

Fresno County Services Area 34 (Millerton), CA - Project Manager for water treatment and wastewater treatment needs for a new 400-lot foothill subdivision. Plans were prepared for a 350 gpm surface water treatment plant; wastewater facilities included design and construction of a STEP collection system, 0.11 mgd recirculating gravel filter treatment plant, and effluent disposal via ponds and spray irrigation.

Golden Hills Community Services District, Kern County, CA - Developed a masterplan for a $20 million wastewater collection, treatment, and reclamation facilities for a 4300 lot community in the Tehachapi mountains.

B.S. Mechanical Engineering, University of California, Davis, 1973
M.S. Civil Engineering, University of California, Davis, 1975

Civil Engineer, California, #28098

National Society of Professional Engineers
American Water Works Association
California Water Environment Association

Jim Patten, PE

Mr. Patten is an engineer with over twenty-five years of professional experience. He is responsible for feasibility studies, design and construction management of water supply, drainage, water, and wastewater treatment projects for public agencies and private developers. Mr. Patten specializes in hydraulics, mechanical, and chemical systems and system controls. Additionally, he works closely with regulatory agencies, particularly related to domestic water quality.

EXPERIENCE

- ***City of Huron, CA*** - Design and construction management of a 1.0 MGD water treatment plant expansion and the addition of a 1.0 MG storage tank, including a transmission main and variable speed booster station.

- ***Millerton New Town, Friant, CA*** - Construction management for wastewater treatment and disposal facilities and design of water supply and treatment facilities.

- ***Boron Community Services District, Boron, CA*** - Prepared a feasibility study for expanding water and wastewater systems. Prepare construction documents for recoating of the District's 1 million gallon storage tank.

- ***Golden Hills Community Services District, Tehachapi, CA*** - Field investigations (pilot program), final design and construction management of facilities for a groundwater recharge program. Design of water treatment plant modifications and operational assistance at the water treatment plant. Network analysis of water distribution system.-

- ***Golden Hills Community Services District, Tehachapi, CA*** - Field investigations (pilot program), final design and construction management of facilities for a groundwater recharge program. Other projects included preparation of a District inspection and maintenance program for drainage facilities, design of water treatment plant modifications, operational assistance at the water treatment plant and HEC-2 analysis for a major natural drainage channel.

- ***Small Water Systems*** - Design of modifications to small water systems to comply with new water treatment regulations; preparation of operations plans and monitoring plans.

- ***Mariposa P.U.D Water System, Mariposa, CA*** - Modeled and evaluated the existing municipal system to determine deficiencies, evaluate alternatives, identify improvements, and prepare capital improvement plan. Prepared plans and specifications for construction of a new 1 million gallon storage tank, booster pump station, pressure reducing stations and transmission main. Prepared plans and specifications for replacement of mains in the downtown area.

? ?***Armona CSD Water System Evaluation, Armona, CA*** – Modeled the existing municipal system and analyze to determine deficiencies, evaluate alternatives, identify improvements, and prepare capital improvement plan.

? ?***Coalinga U.S.D. Water System Evaluation, Coalinga, CA*** - The existing city system was modeled and evaluated to determine deficiencies, evaluate alternatives, and identify needed improvements.

? ?***Armona C.S.D. Water System Improvements, Armona, CA*** – Assisted in preparation of plans and specifications for replacement of water mains, installation of equipment for removal of hydrogen sulfide from groundwater supply, construction of storage tanks, and new booster pump stations.

? ?***City of Clovis Well Chlorination Facilities and GAC Facilities, Clovis, CA*** - Design and bidding assistance for construction of on-site chlorine generating facilities for city wells, and granular activated carbon facilities for two wells.

? ?***Malaga CWD-GAC Facilities, Malaga CWD, CA*** - Assisted in the design, equipment procurement and construction management of GAC facilities for a municipal well.

? ?***Brighton Crest, Friant, CA*** - Design and construction management for domestic water treatment plant and supporting utilities. Project included a new water surge tank and pipeline, telemetry system, 0.5 MGD water treatment plant and treated water booster pumps.

? ?***Golden Hills Community Services District, Tehachapi, CA*** - Field investigations (pilot program), final design and construction management of facilities for a groundwater recharge program. Other projects included preparation of a District inspection and maintenance program for drainage facilities, design of water treatment plant modifications, operational assistance at the water treatment plant and HEC-2 analysis for a major natural drainage channel.

B.S. - Civil Engineering - University of California, Davis

Registered Civil Engineer (California) RCE 26341

WateReuse Association of California

John Hernandez, RCI

Mr. Hernandez is the firm's lead construction manager. He is a registered construction inspector with 37 years experience in the areas of wastewater and water treatment plants, water distribution systems, wastewater collection systems, storm drainage pump and pipeline improvements, street and highway construction, and subdivision work. In addition to his background in construction management of public works projects, and supervision of construction department personnel, his experience includes design layout, design and construction surveys, processing payments and governmental funding forms.

EXPERIENCE

? ?***Fresno County Transportation Authority, Fresno, CA*** – c/o Nolte Engineers. Construction review of Segment 4 and 5 of Route 168 between Bullard Avenue and Temperance Avenue. Performed inspections on installation of underground utilities and storm drainage structures.

? ?***Armona Community Services District***, ***Armona, CA*** – Project construction manager and resident inspector for a $2.1 million dollar water supply and water treatment plant and facilities. The project consists of 2.1 miles of transmission pipeline ranging from 6" to 12" mains with approximately 256 water services and appurtenances. The project included 3 bolted steel water storage tanks with the largest being 311,000 gallons in capacity. The process treatment system was chemical and filtration treatment, which included booster pump, backwash filter media vessels, chemical storage tanks, electrical, prefabricated metal building and project site improvements.

? ?***Allensworth Community Services District***, ***Allensworth, CA*** – Project construction manager and resident inspector for a $766,500 water supply project. The project consists of 4.1 miles of 6" transmission pipeline plus the construction of one municipal 250 gallons per minute water well and improvements, to include electrical controls and hydropneumatic tank.

? ?***Saxon Creek Water Project, Mariposa, CA*** - Project construction manager and resident inspector for a $10 million water supply project for the community of Mariposa. The project consists of four construction contracts for 2 -1,000 hp pumps rated at seven cfs and 2000-foot head. The pumps are installed in an underground pumping station. Also included is eight miles of 12" transmission pipeline, a 1.0 million gallon storage tank, and a 70/4.16 KV electrical substation.

? ?***Mariposa Water Supply Project, Mariposa, CA*** - Project construction manager for a $1.0 million water supply project for the Community of Mariposa. The project includes modifying an existing pump station and constructing a new pump station, 1 mile of 12" pipeline, and a 1.0 mg welded steel storage tank.

? ?***Aqueduct Turnout, Dudley Ridge, CA*** - Construction manager for a new turnout

constructed on the California Aqueduct to serve agricultural lands.

? ?***Water Well Projects, Parlier, CA*** - Project construction manager for drilling, testing, and installation of pumping equipment for three municipal water wells.

? ?***Water Supply/Treatment Project, Dos Palos, CA*** - Construction manager, resident inspector and loan/grant administration for a $5.5 million water transmission main, water treatment project, concrete structures & holding ponds.

? ?***North Fork Water System Improvements, Madera County, CA*** - Construction Manager, Resident Inspector, Loan and Grant Administration. Construction included a 200,000 gallon reservoir and 7,700 feet of road reconstruction and holding ponds.

? ?***Dos Palos, CA -*** Construction Manager, Resident Inspector, Loan and Grant Administrator for construction of aeration ponds, sludge digester, clarifier, piping, fittings and holding ponds.

? ?***City of Fowler, CA*** - Resident Inspector for Fowler, water distribution system improvements of 3? miles at 15".

? ?***Armona Community Services District, Armona CA*** - Construction manager and resident inspector for a $2.1 million dollar water supply and water treatment plant and facilities. The project consists of 2.1 miles of transmission pipeline ranging from 6" to 12" mains with approximately 256 water services and appurtenances. The project included 3 bolted steel water storage tanks with the largest being 311,000 gallons in capacity. The process treatment system was chemical and filtration treatment, which included booster pump, backwash filter media vessels, chemical storage tanks, electrical, prefabricated metal building and project site improvements.

? ?***Selma-Kingsburg-Fowler Interceptor Sewer*** - Resident Inspector for construction of 15 miles of pipeline construction, included 42" to 12" distribution structure. Both on and off road included paving.

? ?***City of Orange Cove, CA*** - Resident Inspector for construction of Orange Cove Water Treatment Plant.

A.S. Degree in Public Works, Fresno City College, Fresno, 1980

Public Works Technician, Certificate - 1978
Registered Construction Inspector, California, #794

American Leak Detection Company

American Leak Detection (ALD) has been the recognized world leader in the detection of concealed leaks since 1974. Whether a leak is in your pool, spa, sewer, well or other concealed plumbing system, we offer you a prompt, reliable, accurate and economical solution.

It takes a blending of expert technicians and quality equipment to end the damage and costs associated with hidden leaks. Our extensive training programs, state-of-the-art equipment and commitment to customer service have saved our customers millions of dollars and billions of gallons of water.

MUNICIPAL SERVICES

Services listed vary between territories. contact your local American Leak Detection office for services offered in your local area.

ALD provides complete leak surveys on water distribution systems using state-of-the-art equipment including advanced correlation technology. We also provide quick response to local emergencies such as main line breaks.

Call ALD

- Before property damage occurs
- To Reduce operating expenses and unaccounted for water
- For professional reports
- To eliminate dry holes
- To decrease liability for catastrophic breaks

The mission of American Leak Detection is to find leaks in a manner that is non-invasive, efficient and environmentally sound. We will give prompt, professional and courteous service to all customers, while providing the best leak detection services in the world.

Table 2 - Propsed Project Timetable

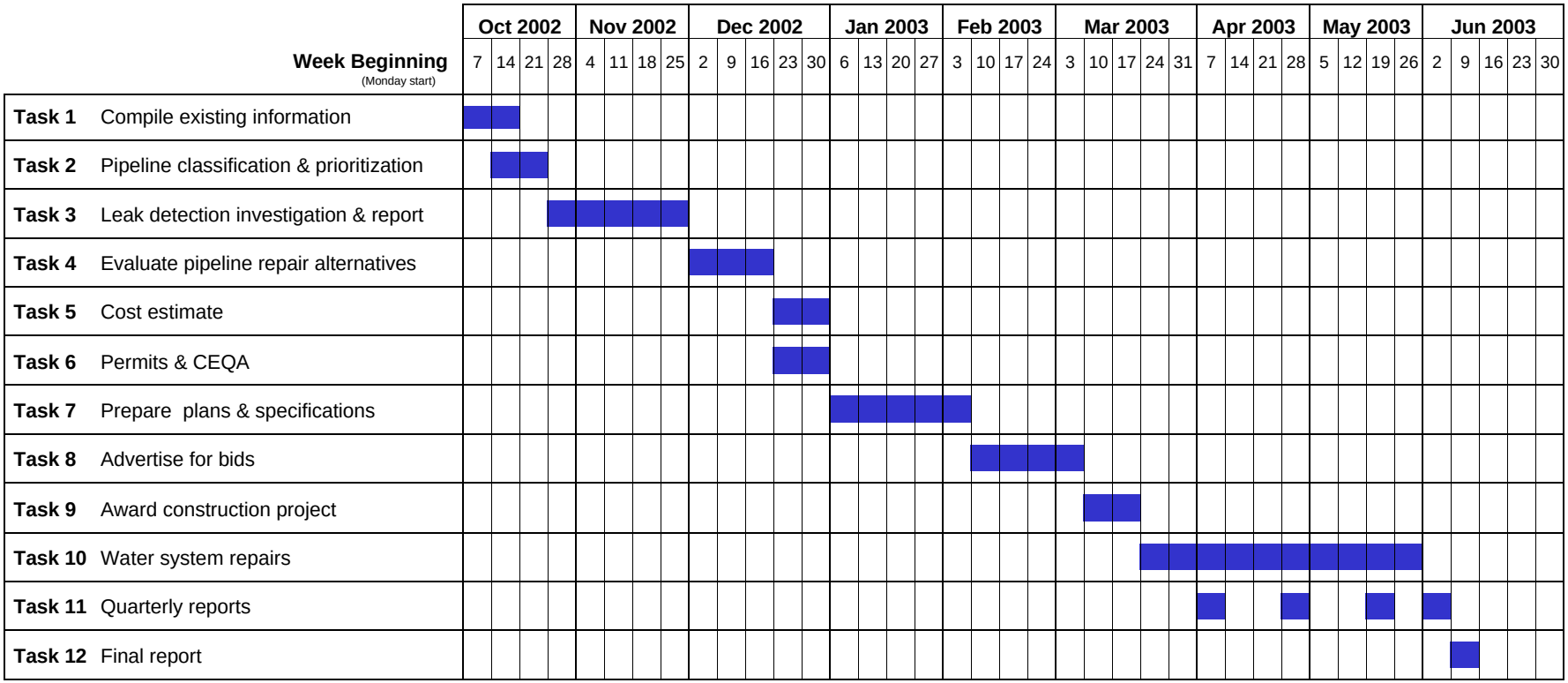


Table 1 - Estimated Staffing and Cost

(Detailed estimate for items b, d, and j in Table 3)

		Consultant Labor Costs						Subconsultant Costs		Other Direct Costs					Totals	
	STAFF HOURS	Principal Engineer II	Associate Engineer I	Associate Technician II	Assistant Technician II	Construction Inspector	Clerical II	Leak Detection	Surveying	Mileage at $0.45/mi.	Printing & Postage	Communications	Other Costs		Total Hours	Total Cost
	Rate / Hour	$140	$90	$75	$60	$85	$45									
Task 1	Compile existing information	-	10	15	-	-	-	-	-	-	-	-	-		**25**	**$2,025**
Task 2	Pipeline classification & prioritization	-	10	40	20	-	-	-	-	-	-	-	-		**70**	**$5,100**
Task 3	Leak detection investigation & report	2	10	-	-	-	-	$33,000	-	-	-	$50	-		**12**	**$34,230**
Task 4	Evaluate pipeline repair alternatives	2	8	8	20	-	-	-	-	-	-	-	$1,500		**38**	**$3,500**
Task 5	Cost estimate	-	8	-	8	-	-	-	-	-	-	-	-		**16**	**$1,200**
Task 6	Permits & CEQA	1	5	-	-	-	2	-	-	-	$50	-	-		**8**	**$730**
Task 7	Plans and specifications	4	20	80	-	4	20	-	$5,000	-	$200	-	-		**128**	**$14,800**
Task 8	Advertise for bids	-	5	-	-	-	2	-	-	-	$500	$50	$2,000		**7**	**$3,090**
Task 9	Award construction contract	1	5	-	-	-	-	-	-	-	-	-	-		**6**	**$590**
Task 10	Water system repairs	5	10	10	-	32	-	-	$2,000	$250	$50	-	-		**57**	**$7,370**
Task 11	Quarterly progress reports	5	10	10	-	-	10	-	-	-	$50	$50	-		**35**	**$2,900**
Task 12	Final report	1	5	5	-	-	5	-	-	-	$200	-	-		**16**	**$1,390**
	Total Hours:	21	106	168	48	36	39								**418**	
	Total Cost:	$2,940	$9,540	$12,600	$2,880	$3,060	$1,755	$33,000	$7,000	$250	$1,050	$150	$3,500			**$76,925**
														Contingencies (15% min):		**$11,539**
														TOTAL ESTIMATED FEASIBILITY STUDY COST:		**$88,464**